Claims

1. Electronic microwave circuit (1) with GaAs field-effect transistors (15), which are integrated onto a semiconductor substrate (5), for switching electronic high frequency input signals (16) and at least one light source (2) for illuminating the GaAs field-effect transistors (15), characterised in that the intensity of the light source (2) and/or the colour of the light source may be changed during operation.

2. Electronic microwave circuit according to claim 1, characterised in that the light source (2) is able to illuminate in different colours alternately or simultaneously, particularly in red, yellow, green, white, blue, ultraviolet and infrared.

3. Electronic microwave circuit according to claim 1 or 2, characterised by a control device (6) which controls or regulates the intensity and/or colour of the light source (2).

4. Electronic microwave circuit according to claim 3, characterised in that the control device (6) controls or regulates the intensity and/or the colour of the light source (2) dependent upon at least one measurement variable or a combination of measurement variables.

5. Electronic microwave circuit according to claim 4, characterised in that the measurement variables are:

- the polarity of the signal voltage of the high frequency signal (16) to be switched, relative to the control voltage with which the field-effect transistors (15) are controlled

- the size of the signal voltage of the high frequency signal (16) to be switched, relative to the control voltage with which the field-effect transistors (15) are controlled

- the temperature of the field-effect transistors (15)
- the size of the signal voltage of the high frequency signal (16) to be switched,
- the level of the signal frequency of the high frequency signal (16) to be switched.

6. Electronic microwave circuit according to claim 4 or 5, characterised in that the control device (6) controls or regulates the intensity and/or colour of the light source (2) in such a manner that the switching times of the field-effect transistors (15) remain constant over the whole range of values of the measurement variables used that occur in operation.

7. Electronic microwave circuit according to claim 6, characterised in that the intensity of the light is selected to be just large enough and/or the wavelength of the light colour is optimised to be, for example, as small as possible or as energetic as possible.

8. Electronic microwave circuit according to claim 6 or 7, characterised in that the switching times of the field-effect transistors (15) are minimised.

9. Electronic microwave circuit according to one of the claims 4 to 8, characterised in that the control device (6) has a store (7) in which the optimum intensity and/or colour of the light source (2) dependent upon the values of the measurement variables used is stored for a plurality of values of the measurement variables, and that the control device (6) sets or controls or regulates the intensity and/or the colour of the respective light source (2), based on the values stored in the store (6) of the measurement variables used.

10. Electronic microwave circuit according to one of the claims 1 to 9, characterised by at least one sensor (8) in the region of the respective GaAs field-effect

transistor (15) and of the respective semiconductor substrate (5), for detecting the light intensity and/or the temperature.

11. Electronic microwave circuit according to one of the claims 1 to 10, characterised in that the electronic microwave circuit (1) comprises a damping circuit with damping which can be switched in steps.

12. Calibrating device (20) for calibrating the intensity and/or colour of a light source (2) of an electronic microwave circuit (1), the intensity and/or colour of said light source being changeable during operation, said microwave circuit having GaAs field-effect transistors (15) illuminable by the light source (2), with a signal generator (21) for generating high frequency input signals (16) to a calibrating output (29), via which the high frequency input signals (16) are fed to an input (9) of the microwave circuit (1), with a calibrating input (30) via which the high frequency signals altered by the microwave circuit (1) are fed again to the calibrating device (20), with a control unit (22), for controlling the light source (2) and the switching processes of the microwave circuit (1) via a calibrating connection (24), and of the signal generator (21), whereby the control unit (22) evaluates high frequency output signals (17) input via the calibrating input (30) and places the result of the evaluation in a store (7) of the microwave circuit (1).

13. Calibrating device according to claim 12, characterised by a control connection (23) for controlling a cooling/heating system (31) for cooling or heating the field-effect transistors (15).

14. Method for operating a calibrating device (20) on a microwave circuit (1) according to one of the claims 1 to 11, having the following method steps:

- stepwise adjustment and detection of the influencing variables:
  - intensity and/or
  - colour

of the light source (2) of the microwave circuit (1) and at least one of the measurement variables

- the polarity of the signal voltage of the high frequency signal (16) to be switched, relative to the control voltage with which the field-effect transistors are controlled
- the size of the signal voltage of the high frequency signal (16) to be switched, relative to the control voltage with which the field-effect transistors are controlled
- the temperature of the field-effect transistors
- the level of the signal voltage of the high frequency signal (16) to be switched,
- the level of the signal frequency of the high frequency signal (16) to be switched
- storage of the value combinations or of the value tuples of the changed and detected values of the influencing variables and of the measurement variables
- evaluation of the value combinations or value tuples
- transfer of the evaluation results to the microwave circuit (1).

15. Method according to claim 14, characterised in that the evaluation of the value combinations or value tuples takes place such that an n-dimensional table is generated from which for each combination of the individual values of the measured measurement variables, the respective values of optimal light intensity and/or optimal light colour can be read out.